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What are the key parameters for assessing the quality of glass fibers?

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The physical characteristics of glass fibers are more complicated than those of bulk glasses, since fibers are generated under extreme forming conditions such as larger deformation force and much fast quenching. Consequently, fibers possess different microstructure, higher potential energy and entropy and a significantly larger surface area, in contrast to their bulk counterpart. Owing to rather small diameters of glass fibers, accurate characterizations of the physical properties are particularly challenging, and time consuming. Therefore it would be highly beneficial, if the glass fiber community could find and agree on two or three representative parameters that can be used to assess the fiber quality (note: not functionality). Such parameters should be easily measured and connected to other parameters. In this talk, I suggest two or three key parameters to be used as possible criteria for assessing fiber quality, with focus on both continuous fibers for reinforcement and wool fibers for insulation. One parameter is related to the surface characteristics, while the other is connected to the bulk properties. I discuss why these parameters are chosen, and I use a couple of examples to illustrate how to determining them.